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1215064

COMPLETE SPECIFICATION

1 SHEET

*This drawing is a reproduction of  
the Original on a reduced scale*

Fig. 1

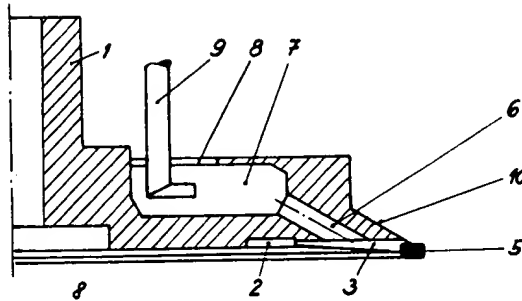


Fig. 2

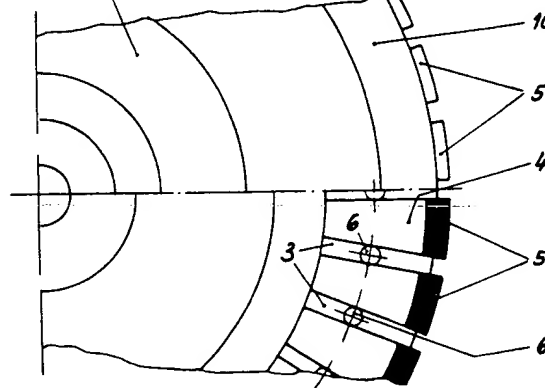


Fig. 3



Fig. 4

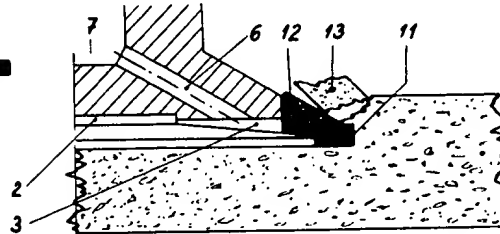
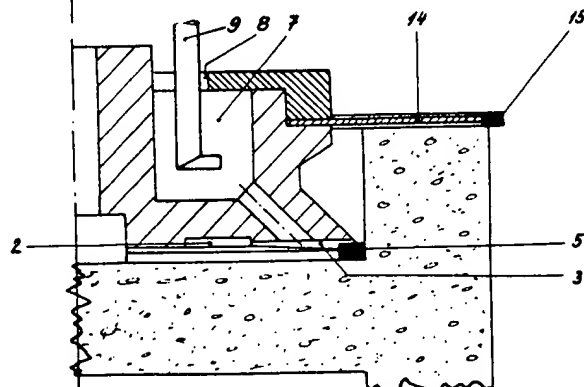


Fig. 5



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# PATENT SPECIFICATION

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DRAWINGS ATTACHED

1 215 064

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GREAT BRITAIN  
 GROUP 326  
 CLASS 51  
 RECORDED

## (54) IMPROVEMENTS RELATING TO STONE CUTTING AND FINISHING WHEELS

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 trading as BAYERISCHE MASCHINENFABRIK F.  
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 feninger Schloss-strasse 7, Germany, do  
 hereby declare the invention, for which we  
 pray that a patent may be granted to us,  
 and the method by which it is to be per-  
 formed, to be particularly described in and  
 by the following statement:—

The invention relates to a cutting and  
 finishing wheel for stone or artificial-stone  
 workpieces for use in surface-working  
 machines.

Such wheels for surface-working machines  
 are normally of carborundum, and the work-  
 piece, consisting for example, of a step of  
 a staircase, a flagstone or a windowsill, is  
 ground away to the necessary extent in a  
 large number of reciprocating cuts or passes,  
 all the material having to be removed by  
 cutting. The repeated grinding of the work-  
 piece to and fro takes a considerable time,  
 and because of the cutting away of all the  
 material to be removed, makes a very high  
 consumption of abrasive necessary.

For faster working the wheel may be  
 fitted with diamond segments, but these seg-  
 ments have only a short life and are there-  
 fore very costly.

According to the present invention a cut-  
 ting and finishing wheel is divided at its  
 periphery into segments which are separated  
 by cooling-water channels supplied by in-  
 ternal passages and each of which is pro-  
 vided with a radially projecting diamond  
 segment. The provision of the cooling-  
 water channels enables cooling-water to flow  
 directly to the point of cutting so as to  
 obtain effective cooling at the point where  
 it is required and the combination of this  
 with the diamond segments enables the cut-  
 ting operation to be carried out in a single  
 pass, thus considerably facilitating overall  
 operation.

The wheel is preferably provided with an  
 annular chamber for cooling water which  
 is located inwardly from the diamond seg-

ments and which is connected to the cool-  
 ing water channels. This chamber has an  
 inlet for water, thus enabling a continuous  
 flow of water to be supplied to the channels.  
 Since the chamber is located in the interior  
 of the wheel the water in the chamber is  
 thrown outwardly by centrifugal force to  
 provide a continuous supply of cooling water  
 under pressure.

Constructions in accordance with the in-  
 vention will now be described by way of  
 example with reference to the accompanying  
 drawings in which:

Figure 1 is an axial section through one  
 half of a cutting and finishing wheel;

Figure 2 shows the wheel in upper and  
 lower plan views;

Figure 3 is an axial section through the  
 outer part of the wheel;

Figure 4 is an axial section of the outer  
 part of a modified wheel; and

Figure 5 is an axial section of a modified  
 construction of wheel.

Turning first to Figures 1 and 2, the wheel  
 1 is mounted on a driving shaft (not  
 shown). The outer edge of the wheel tapers  
 outward conically and is provided on the  
 underside with radially extending milled  
 channels 3, adjoining an annular duct 2.  
 The segments 4 formed on the wheel by  
 the radial milled channels 3 are provided at  
 their outer periphery with diamond seg-  
 ments 5 projecting radially outwards. These  
 diamond segments are so secured to the  
 wheel segments, for example, by electric  
 soldering, that they project a little beyond  
 the outer periphery of the wheel.

Connecting passages 6 open into the  
 milled channels 3 and are connected to an  
 annular cooling-water chamber 7. The  
 cooling-water chamber 7 is provided in a  
 thickened portion of the wheel 1 and has  
 at the top in its inner portion an annular  
 opening 8 through which cooling water is  
 continuously supplied through a supply pipe  
 9. Due to the very rapid rotation of the  
 wheel, the water in the chamber 7 is forced  
 by the centrifugal force into the outer por-

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tion which is closed at the top and from there through the connecting passages 6 into the milled channels 3 located between the wheel segments 4, to reach the diamond seg-

5 ments 5. In this way, the diamond segments are constantly subjected to ample cooling and the water is forced against the surface of the workpiece adjacent the diamond segments and which is to be cut  
10 into. This surface is also cooled and the grinding sludge carried away. If too much water is conveyed outward through the connecting ducts 6, it is able to collect in the annular inner duct 2.

15 Because of the effective cooling, it is possible, by means of the narrow, radially projecting diamond segments, to cut workpieces directly to the required thickness without the need for any subsequent finishing operation.

20 Thus, the wheel according to the invention cuts through the workpiece in a single cut in contrast to the normal wheels. The wheel cuts horizontally as seen in Figures 1 and 2, and the surface of the workpiece  
25 which is left above the diamond segments 5 is broken away upwards by the wall 10 of the wheel which tapers conically towards the diamond segments. It is consequently possible to cut the workpiece directly to the  
30 required thickness and work the surface appropriately in one operation.

In Figure 4, the diamond segments flare conically inwardly at 12 from the projecting front cutting surface 11, so that the  
35 surface 13 of the workpiece left above the segment is broken off by the harder segments. The diamond segments are harder than the steel of the wheel, so that damage to the wheel is thereby avoided.

40 In the construction of Figure 5 a wheel according to Figures 1 to 3 is fitted with a second similar wheel 14 with diamond segments 15. This supplementary wheel 14 is useful when working stepped workpieces,

such as, for example, steps of a staircase, because it can cut a stepped surface immediately to the correct height. 45

If such wheels are employed in surface working machines in which the workpiece can be so fixed on the machine table by  
50 means of a three-point support that all the surfaces to be finished can be worked by corresponding wheels without changing the workpiece round or readjusting it, a very, 55  
considerable saving in time is made owing to the fact that each wheel needs to be carried past the workpiece only once. When, furthermore, due to the good cooling action, the life of the diamond segments is considerably extended, such a surface-working 60  
machine brings a substantial saving in time and expense.

#### WHAT WE CLAIM IS:—

1. A cutting and finishing wheel for stone or artificial-stone workpieces divided at  
65 its periphery into segments which are separated by cooling-water channels supplied by internal passages and each of which is provided with a radially projecting diamond  
70 segment.

2. A wheel according to claim 1, and provided with an annular cooling-water chamber located inwardly from the diamond segments and which is connected to the  
75 cooling-water channels and has a water inlet.

3. A wheel according to claim 1 or claim 2 having a wedge-shaped periphery for lifting undercut parts of a workpiece.

4. A wheel according to claim 3 in which the wedge-shaped portion is defined  
80 by extensions of the diamond segments.

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